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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,875	04/19/2005	Hironori Kobayashi	SIP-0201	4078

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EXAMINER	
MAKI, STEVEN D	

ART UNIT	PAPER NUMBER
1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/531,875	KOBAYASHI, HIRONORI	
	Examiner	Art Unit	
	Steven D. Maki	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-10* is/are pending in the application.

4a) Of the above claim(s) *7 and 8* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-6, 9 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1) A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1-25-08 has been entered.

2) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3) **Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maruoka et al (WO 2003/059654) in view of Carolla et al (US 4,722,378).**

US 2005/0000613 is an English language equivalent to WO 2003/059654.

Maruoka et al, directed to suppressing uneven wear and equalizing the wear, discloses a heavy duty pneumatic tire comprising four circumferential grooves wherein when the tire is mounted on a regular rim, a regular internal pressure is charged into the tire and a normal load is applied to the tire, the total sum of ground contact force on the tire satisfies the following ratios: P2c/P1a = 0.9 to 1.05, P2e/P2c = 0.75 to 1.0, P3c/P2e = 0.9 to 1.2, and P3e/P3c = 0.8 to 1.1. In embodiment A2 in Table 1, the ratio of P2e/P2c for the middle rib is 0.90 and the ratio P3e/P3c for the shoulder rib is 0.96. Each total sum of the ground contact force P1a, P2c, P2e, P3c and P3e can be

obtained using a sheet body with a large number of sensors. See paragraph 46 of US 2005/0000613.

Maruoka et al's ratio P2e/P2c is the ratio of sum of ground contact force of right side of middle rib to sum of ground contact force of left side of middle rib. **The ratio P2e/P2c for the middle rib (second rib) is 0.75-1.00 such as 0.90.** The ratio P2e/P2c for Maruoka et al's middle / second rib generally corresponds to the "MIDDLE RIB GROUND CONTACT PRESSUE RATIO" of "a ratio of second-rib-outer edge ground-contact pressure to second-rib-middle ground-contact pressure" (Beo/Bc) to "a ratio of second-rib-inner edge ground-contact pressure to second-rib-middle ground-contact pressure" (Bei/Bc). **Claim 1 requires a "MIDDLE RIB GROUND CONTACT PRESSUE RATIO (Beo/Bc) / (Bei/Bc)"of "0.75 to 0.95" to "0.80 to 1.00". Applicant's third example demonstrates a "MIDDLE RIB GROUND CONTACT RATIO (Beo/Bc) / (Bei/Bc)" of 0.80 / 0.90 = 0.89.**

Maruoka et al's ratio "P3e/P3c" is the ratio of sum of ground contact force of right side of shoulder rib to sum of ground contact force of left side of shoulder rib. **The ratio P3e/P3c for the shoulder rib is 0.80-1.10 such as 0.96.** The ratio P3e/P3c for Maruoka et al's shoulder rib generally corresponds to the "SHOULDER GROUND CONTACT PRESSUE RATIO" of "a ratio of shoulder-rib-outer edge ground-contact pressure to shoulder-rib-middle ground-contact pressure" (Ceo/Cc) to "a ratio of shoulder-rib-inner edge ground-contact pressure to shoulder-rib-middle ground-contact pressure" (Cei/Cc). **Claim 1 requires a "SHOULDER RIB GROUND CONTACT PRESSUE RATIO (Ceo/Cc)/(Cei/Cc)" of "0.0.85-1.00" to "0.80 to 0.95". Applicant's**

third example demonstrates a "SHOULDER RIB GROUND CONTACT RATIO" of 0.85 / 0.90 = 0.94.

With respect to "a ratio of center-rib-edge ground contact pressure to center-rib-middle ground-contact pressure" (Ae/Ac) being 0.80 to 1.00, Maruoka et al teaches that P2c/P1a is 90-105% wherein P1a is the sum of ground contact pressure for the right side of the center rib. In example 3, applicant's ratio of (Bei/Bc) to (Ae/Ac) is 0.90/0.89 = 1.01. In Embodiment A2, Maruoka et al's ratio of P2c/P1a is 0.93. In Embodiment A1, Maruoka et al's ratio P2c/P1a is 1.03. The claimed ratios of ground contact pressure are satisfied by Maruoka et al's tire such as embodiment A2. In any event: It would have been obvious to one of ordinary skill in the art to provide Maruoka et al's four groove heavy duty pneumatic tire such that the tire satisfies the claimed ground contact ratios since Maruoka et al teaches suppressing uneven wear and equalizing the wear by providing a heavy duty pneumatic tire comprising four circumferential grooves such that when the tire is mounted on a regular rim, a regular internal pressure is charged into the tire and a normal load is applied to the tire, the total sum of ground contact force on the tire satisfies the following ratios: P2c/P1a = 0.9 to 1.05, P2e/P2c = 0.75 to 1.0, P3c/P2e = 0.9 to 1.2, and P3e/P3c = 0.8 to 1.1. Maruoka et al is silent as to the ground contact pressure in each of the center rib, second rib and shoulder rib gradually decreasing from the middle of the rib toward the edges.

As to claim 1, it would have been obvious to one of ordinary skill in the art to configure the surface of each of the ribs of Maruoka et al such that the ground contact pressure in each of the center rib, second rib and shoulder rib gradually decreasing

from the middle of the rib toward the edges since Carolla et al teaches forming a tread element such as a rib with a convex ground engaging surface such that the contact pressure is higher at the center of the ground engaging surface than at its edges so that water is not trapped between the edges of the tread element (figure 4, figure 10, col. 5 lines 65-68, col. 6 lines 1-29). Hence, Carolla et al motivates one of ordinary skill in the art to optimize the ground pressure of each rib such that the ground contact pressure decreases from the center of the rib to the edges of the rib. The benefit of such optimization is prevention of hydroplaning by preventing water from being trapped between the edges of the rib.

4) **Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruoka et al in view of Carolla et al as applied above and further in view of Japan 727 (JP 6-344727).**

Maruoka et al is discussed above. As to claim 3, it would have been obvious to one of ordinary skill in the art to incline the walls of the circumferential grooves of Maruoka et al's heavy duty tire such that they are inclined as claimed since Japan 727 suggests preventing stone biting, preventing localized abrasion and enhancing driving stability by providing the four circumferential grooves of a pneumatic tire for heavy load such that the sidewalls of the outer circumferential grooves are inclined at an angle alpha of 0-20 degrees (preferably 5-15 degrees) and the sidewalls of the inner circumferential grooves are inclined at an angle beta of 0-20 degrees (preferably 5-15 degrees). In examples 1-3, the angle alpha for the outer groove is 14.5 degrees (within

the claimed range of -10 degrees to +20 degrees) and the angle beta for the inner groove is 13.5 degrees (within the claimed range of +10 to +20 degrees).

As to claims 4 and 5, Japan 727 suggests a substantially constant angle beta such as 13.5 degrees with respect to the normal to the tread surface for both sides of the inner circumferential grooves.

As to claims 4 and 6, Japan 727 suggests a substantially constant angle alpha such as 14.5 degrees with respect to the normal to the tread surface for both sides of the outer circumferential grooves.

5) **Claims 3-6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruoka et al in view of Carolla et al as applied above and further in view of Tozawa et al (US 2001/0054464), Japan 727 (JP 6-344727) and Japan 406 (JP 63-068406).**

Maruoka et al is discussed above. As to claims 3-6 and 9, it would have been obvious to incline the walls of the circumferential grooves of Maruoka et al's heavy duty tire such that each of the outer groove angles is less than each of the inner groove angles since Tozawa et al suggests inclining the sidewalls of outer circumferential grooves at a negative angle (90 degrees - angle alpha) and inclining the sidewalls of inner circumferential grooves at positive angles (figure 1, figure 3) so that ground pressure on both sides of the outer main grooves is equalized to thereby control uneven wear.

With respect to the claimed outer groove angle being -10 degrees to less than 20 degrees, Tozawa et al teaches using a negative angle of less than zero degrees such as -10 degrees (e.g. 90 degrees - 100 degrees).

With respect to the claimed inner groove angle, it would have been obvious to one of ordinary skill in the art to incline the walls of the inner circumferential grooves at a positive angle of from 10 degrees to less than 20 degrees since (1) Tozawa et al suggests inclining the sidewalls of inner circumferential grooves at a positive angle and (2) Japan 727 and Japan 406 teach that when sidewalls of inner circumferential grooves are inclined at a positive angle, the positive angle should be for example 13.5 degrees (Japan 727, figure 1b, table) and 12 degrees (Japan 406 figure 5, table 1), respectively.

6) **Claims 3-6, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruoka et al in view of Carolla et al as applied above and further in view of Europe 599 (EP 728599).**

Maruoka et al is discussed above. As to claims 3-6, 9 and 10, it would have been obvious to incline the walls of the circumferential grooves of Maruoka et al's heavy duty tire such that each of the outer groove angles is less than each of the inner groove angles since Europe 599 teaches inclining the groove walls of inner and outer circumferential grooves of a tire tread such that the ratio m/n (bottom width / top width) of the outer circumferential grooves is more than 0.5 and not more than 1.0 whereas the ratio m/n (bottom width / top width) of the inner circumferential grooves to obtain reduction in running noise and improvement in aquaplaning performance. With the values of top width n = 8mm, bottom width m = 3.2 mm, and depth = 8 mm (invention

example, Table 1), the angle of the groove wall of in the inner circumferential groove is 16.7 degrees. With the values of top width n = 8mm, bottom width m = 4.8 mm, and depth = 8 mm (invention example, Table 1), the angle of the groove wall of in the outer circumferential groove is 11.3 degrees.

With respect to the claimed inner groove angle being 10 degrees to less than 20 degrees (claims 3, 9 and 10), Europe 599 teaches an example angle of 16.7 degrees for the inner circumferential groove.

With respect to the claimed outer groove angle being -10 degrees to less than 20 degrees (claims 3 and 9) or greater than 0 degrees to less than 20 degrees (claim 10), Europe 599 teaches an example angle of 11.3 degrees for the outer circumferential groove.

As to claims 4-6, Europe 599 teaches using substantially constant and equal angles for the inner circumferential grooves and substantially constant and equal angles for the outer circumferential grooves.

Remarks

7) Applicant's arguments with respect to claims 1, 3-6, 9 and 10 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 1-25-08 have been fully considered but they are not persuasive.

Applicant comments that Maruoka et al provides no values for the contact pressures at the locations defined in the claims. More properly, the middle of Maruoka et al's ribs have a ground contact pressure since the ribs contact the ground during use

of the tire. Moreover, Maruoka et al teaches measuring the ground contact pressure of both sides of the rib using a sheet of sensors. See paragraph 46 of US 2005/0000613, which is an English equivalent of WO 2003/059654 to Maruoka et al. One of ordinary skill in the art would readily understand that such a sheet having a large number of sensors comprises sensors which measure ground contact pressure in the vicinity of the middle of the rib.

Applicant argues that it would not have been obvious to optimize the values of the contact pressures at the center and edges of the rib. This argument is not persuasive since Carolla et al motivates one of ordinary skill in the art to optimize the ground pressure of each rib such that the ground contact pressure decreases from the center of the rib to the edges of the rib. The benefit of such optimization is prevention of hydroplaning by preventing water from being trapped between the edges of the rib.

Applicant argues that the ratio P2e/P2c of Maruoka has a completely different nature from the ratio (Beo/Bc)/(Bei/Bc). Applicant is incorrect. Both ratios compare ground contact pressure on the axially outer side of the rib with the ground contact pressure on the axially inner side of the rib. With respect to applicant's request for "mathematic proof", applicant is advised that the ratio (Beo/Bc)/(Bei/Bc) simplifies to the ratio Beo/Bc. Furthermore, the examiner's position is that the ratio P2e/P2c of Maruoka generally corresponds to (instead of equates with) the ratio (Beo/Bc)/(Bei/Bc). In applicant's case, **the comparison is between the *ground contact pressure* at the outer edge of a rib to the *ground contact pressure* at the inner edge of a rib.** In Maruoka et al, **the comparison is between the *ground contact pressure* on the**

outer half of a rib to the ***ground contact pressure*** on **the inner half of a the rib**. In both cases, ground contact pressure on different sides of the rib is being compared; applicant having presented no convincing argument and/or evidence to the contrary.

8) No claim is allowed.

9) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven D. Maki/
Primary Examiner, Art Unit 1791

Steven D. Maki
April 27, 2008